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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/Gradation/2013-14

06.08.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014

Date of Testing : 06.08.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **26510**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	976	976	3.7	96.3	95-100
22.4	7548	8524	32.2	67.8	60-80
11.2	5355	13879	52.4	47.6	40-60
4.75	5179	19058	71.9	28.1	25-40
2.36	2768	21826	82.3	17.7	15-30
0.600	2334	24160	91.1	8.9	8-22
0.075	2025	26185	98.8	1.2	0-8

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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/Gradation/2013-14 07.08.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014

Date of Testing : 07.08.2014

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **25480**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	799	799	3.1	96.9	95-100
22.4	6435	7234	28.4	71.6	60-80
11.2	4875	12109	47.5	52.5	40-60
4.75	3526	15635	61.4	38.6	25-40
2.36	3421	19056	74.8	25.2	15-30
0.600	4125	23181	91.0	9.0	8-22
0.075	1974	25155	98.7	1.3	0-8

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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/AIV/2014-15

06.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	06.08.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	79	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	20.84	21.67	
	100* (W_2/W_1)%			**21.26**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/S-T/2014-15 06.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Work	Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	06.08.2014

Result : Flakiness Index = **11.36%**

Elongation Index = **13.62%**

Result : Combined Flakiness & Elongation index 24.98%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No: CTCE/BBMP/W.No.09/KRIDL/BC(QB)/2014-15 20.08.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	:	**Technical Manager,** KRIDL, Bangalore.
NAME OF THE WORK	:	Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014
SAMPLE ID	:	Bitumen
PERIOD OF TESTING	:	20.08.2014

The results of the tests conducted on the bitumen sample using for Bituminous Concrete.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	69	60 to 70
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	48	Min. 45
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	290	Min. 220

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ಆಡಳಿತ ಕಛೇರಿ,
ಬೃ. ಪಾ. ಪ್ರ. ಸಂ., ಬೆಂಗಳೂರು-97.

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Job No.: CTCE/BBMP/W.No.09/KRIDL/BC/AIV/2014-15 20.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	20.08.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.20	21.82	**21.51**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/BC/Shape_T/2014-15 20.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Work	Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Bituminous Concrete
Date of Testing	20.08.2014

Result : Flakiness Index = **11.82%**

Elongation Index = **13.48%**

Result : Combined Flakiness & Elongation index **25.30%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/BC/Stripping/2014-15 20.08.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014
Type of Mix	Bituminous Concrete
Date of Testing	20.08.2014

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	2.8	2.97	97.03
2	3.0		
3	3.1		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/BC/Sp_Wa/2014-15 20.08.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements and Asphalting to road from Nanjappa Circle Dwarak Chowltry to Sapthagiri Layout (KEB Office) Road in Ward No. 09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/VSD/PR/295/2013-14 Dated: 22.03.2014
Type of Mix	Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	20.08.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2021	2022	2025	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1271	1272	1275	
4	Weight of saturated surface dry aggregate in air	W_3 g	2040	2042	2045	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	769	770	770	
6	Weight of oven dried aggregate	W_4 g	2024	2022	2027	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.632	2.626	2.632	2.630
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.688	2.696	2.695	2.693
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.79%	0.99%	0.89%	0.89%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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